fied pulse laser beam comprised of laser pulses having durations of less than 1 ns and power levels of more than 100×10^6 Watts with and average beam power in excess of 3 Watts and defining an amplified beam path,

E) a focusing means for focusing on a target said amplified pulse laser beam to a spots smaller in cross section than 100×10^{-6} cm^2 to produce pulse intensity levels in excess of 10^{12} Watts/cm^2.

2. A laser system as in claim **1** and further comprising a multiplexing means for increasing the preamplified pulse rate in said preamplified pulse laser beam.

3. A laser system as in claim **1** wherein said preamplifier is a multi-pass laser amplifier said system further comprising a spatial filter means for spatially filtering said seed beam after its first pass through said first pass through said preamplifier.

4. A laser system as in claim **1** wherein said laser amplifier is a multi-pass laser amplifier.

5. A laser system as in claim **1** wherein said seed laser means comprises a Nd:YAG laser oscillator, a dye laser with a cavity dumper and a frequency doubler.

6. A laser system as in claim **5** wherein said small excimer laser is created within said first laser amplifier.

7. A laser system as in claim **1** wherein said seed laser means comprises a small excimer laser defining a small laser output and a Pockels cell configured to slice a pulse of less than 100 picoseconds from said small laser output.

8. A laser system as in claim **1** wherein said seed laser means comprises a mode-locked, q-switched Cr:LISAF laser.

9. A laser system as in claim **1** wherein said laser system further comprises a saturable absorber dye positioned in said amplifier beam path.

10. An improved high average power, high brightness laser system comprising:

A) at least one seed laser means for producing a seed laser beam consisting of a series of pulses each pulse having a duration of less than 1 ns with a pulse rate in excess of 100 pulses per second,

B) at least one XeCI excimer preamplifier arranged to amplify said seed laser beam to produce a preamplified pulse laser beam defining a preamplified pulse rate,

C) at least one multiplex means for increasing the preamplified pulse rate in said preamplified pulse laser beam,

D) at least one XeCI excimer laser amplifier arranged to amplify said preamplified laser beam to produce an amplified pulse laser beam comprised of laser pulses having durations of less than 1 ns and power levels of more than 100×10^6 Watts with and average beam power in excess of 3 Watts and defining an amplified beam path,

E) at least one focusing means for focusing on a target said at least one amplified pulse laser beam to spots smaller in cross section than 100×10^{-6} cm^2 to produce pulse intensity levels in excess of 10^{12} Watts/cm.

11. A laser system as in claim **10** wherein said at least one XeCI excimer laser amplifier is a plurality of XeCI laser amplifiers being arranged to operate in a parallel configuration.

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